CLAIM AMENDMENTS

Please amend claims 1, 2, 3, 6, 9, 11, 12, 13, 17, 18, 20, 22, and cancel claims 5 and 8 as follows:

1. (Currently Amended) A method for modifying at least one synapse of an artificial ~~a~~ physical neural network, said method comprising the steps of:

providing ~~a~~ an artificial physical neural network comprising at least one neuron and at least one synapse thereof, wherein said at least one synapse is formed from a plurality of nanoconductors ~~nanoparticles~~ disposed and free to move about within a dielectric liquid ~~solution~~ in association with at least one pre-synaptic electrode and at least one post-synaptic electrode thereof and an electric field applied thereof; and

transmitting at least one pulse generated from said at least one neuron to said at least one post-synaptic electrode of said at least one neuron and said at least one pre-synaptic electrode of said at least one neuron of said physical neural network, thereby strengthening at least one nanoconnection of said plurality of nanoconductors ~~nanoparticles~~ disposed within said dielectric liquid ~~solution~~ and said at least one synapse thereof.

2. (Currently Amended) The method of claim 1 further comprising the step of:

increasing an electrical frequency of said electric field applied to said at least one pre-synaptic electrode and said at least one post-synaptic electrode, in response to generating said at least one pulse said at least one neuron, thereby strengthening at least one nanoconnection of said plurality of nanoconductors

~~nanoparticles~~ disposed within said dielectric liquid ~~solution~~ and said at least one synapse thereof.

3. (Currently Amended) The method of claim 1 further comprising the step of:

forming a connection network from said plurality of nanoconductors ~~nanoparticles~~ by applying said electric field to said at least one pre-synaptic electrode and said at least one post-synaptic electrode associated with said plurality of nanoconductors ~~nanoparticles~~.

4. (Previously Cancelled)

5. (Cancelled)

6. (Currently Amended) A method for strengthening nanoconnections of an artificial ~~a~~ physical neural network, said method comprising the steps of:

providing an artificial ~~a~~ physical neural network comprising a plurality of neurons formed from a plurality of nanoconnections disposed and free to move about within a dielectric liquid ~~solution~~ in association with at least one pre-synaptic electrode and at least one post-synaptic electrode; and

activating said subsequent neuron in response to firing an initial neuron of said plurality of neurons, thereby increasing a voltage of a pre-synaptic electrode of said neuron, which causes a refractory pulse thereof to decrease a voltage of a post-synaptic electrode associated with said neuron and thus provides an increased voltage between said pre-synaptic electrode of said preceding neurons and said post-synaptic electrode of said neuron.

7. (Original) The method of claim 6 further comprising the steps of:

firing and activating subsequent neurons thereof in succession in order to produce an increased frequency of an electric field between subsequent pre-

synaptic and post-synaptic electrodes thereof, thereby causing an increase in an alignment of at least one nanoconnection of said plurality of nanoconnections and a decrease in an electrode resistance between said subsequent pre-synaptic and post-synaptic electrodes thereof.

8. (Cancelled)

9. (Currently Amended) A method for forming an adaptive artificial physical neural network utilizing nanotechnology, said method comprising the steps of:

configuring an adaptive artificial physical neural network to comprise a plurality of nanoconductors ~~nanoparticles~~ located and free to move about within a dielectric liquid ~~solution~~, wherein said plurality of nanoconductors ~~nanoparticles~~ experiences an alignment with respect to an applied electric field to form a connection network thereof composed of a plurality of nanoconnections, such that said adaptive physical neural network comprises a plurality of neurons interconnected by said ~~a~~ plurality of ~~said~~ nanoconnections; and

providing an increased frequency of said applied electric field to strengthen said plurality of nanoconductors ~~nanoparticles~~ within said adaptive physical neural network regardless of a network topology thereof.

10. (Original) The method of claim 9 further comprising the step of:

providing at least one output from at least one neuron of said plurality of neurons to an input of another neuron of said adaptive physical neural network.

11. (Currently Amended) The method of claim 9 further comprising the steps of:

automatically summing at least one signal provided by said connection network via at least one neuron of said adaptive physical neural network to provide a summation value thereof;

comparing said summation value to a threshold value and emitting a pulse if a current activation state exceeds said threshold value; and

automatically grounding or lowering to -Vcc a post synaptic junction associated with said at least one neuron during emission of said pulse, thereby causing at least one synapse in receipt of a pre-synaptic activation to experience an increase in a local electric field, such that at least one synapse that contributes to an activation of said at least one neuron experiences an increase in said local electric field parallel to a connection direction associated with said connection network and additionally experiences a higher frequency of activation in order to increase a strength of said plurality of nanoconnections.

12. (Currently Amended) The method of claim 9 wherein at least one neuron of said artificial physical neural network comprises an integrator.

13. (Currently Amended) A method for training an artificial ~~a~~ physical neural network formed utilizing nanotechnology, said method comprising the steps of:

providing an artificial ~~a~~ physical neural network comprising a plurality of neurons connected via a plurality of nanoconductors disposed and free to move about within a dielectric liquid ~~solution~~ to form at least one connection network of nanoconnections thereof, wherein said nanoconnections transfer signals;

presenting an input data set to said physical neural network to produce at least one output thereof; and

increasing network activity within said physical neural network until said at least one output changes to a desired output.

14. (Original) The method of claim 13 wherein the step of increasing said network activity within said physical neural network, further comprises the step of:

increasing a number of firing neurons in said physical neural network.

15. (Original) The method of claim 13 wherein:

said plurality of neurons comprises a plurality of interconnected neurons that are interconnected by said nanoconnections, each of said nanoconnections being associated with a weight; and

said increasing said network activity within said physical neural network includes scaling a weight associated with said nanoconnections by a positive factor.

16. (Original) The method of claim 13 wherein:

said plurality of neurons comprises a plurality of interconnected neurons that are interconnected by nanconnections for transferring signals having a magnitude in a firing state; and

said increasing said network activity within said physical neural network includes increasing said magnitude of said signal in said firing state.

17. (Currently Amended) The method of claim 13, wherein:

said plurality of neurons comprises a plurality of interconnected neurons that are interconnected by a plurality of data input neurons thereof adapted to receive respective external signals;

said increasing said network activity within said artificial physical neural network includes increasing a magnitude of said respective external signals.

18. (Currently Amended) The method of claim 13, wherein:

said plurality of neurons comprises a plurality of interconnected neurons, each of said interconnected neurons being configured to fire when a corresponding excitation level thereof is greater than or equal to a threshold; and

said increasing said network activity within said artificial physical neural network includes lowering said threshold.

19. (Original) The method of claim 18 further comprising the step of:

determining said excitation level of at least one neuron of said plurality of neurons based on a weighted sum of input signals received over respective nanoconnections, said nanoconnections being associated with respective weights; and

adjusting each of said weights when said at least one neuron of said plurality of neurons and a corresponding one of said others of said neurons fire within a prescribed time interval.

20. (Currently Amended) The method of claim 13 further comprising the step of:

increasing said network activity within said artificial physical neural network in response to a signal.

21. (Original) The method of claim 20 further comprising the step of:

providing said desired output data; and

comparing said desired output data and said output to generate said signal in response if said desired output data is not equal to said output.

22. (Currently Amended) The method of claim 13 wherein said artificial physical neural network comprises an adaptive neural network.